

2000-0087-01  
USSN 09/742,485**IN THE CLAIMS:**

1. (Currently Amended) An excimer laser with long life electrodes said laser comprising:

- A) a laser chamber containing a laser gas comprising fluorine;
- B) an electrode set comprising an elongated ~~after machining~~ machined and annealed copper alloy cathode and an elongated ~~after machining~~ machined and annealed copper alloy anode;
- C) a circulating means for circulating said laser gas between said elongated electrode;
- D) a pulse power electrical system for generating electrical pulses between said electrode to produce a laser gain medium.

wherein said cathode and anode are annealed after they are machined to reduce surface stress and to reduce exposed metallic grain boundary length on surfaces of said cathode and anode.

2. (Original) A laser as in Claim 1 wherein said elongated anode is comprised of at least 70% copper and 7% aluminum.

3. (Original) A laser as in Claim 2 wherein said elongated anode also is comprised of nickel and iron.

4. (Original) A laser as in Claim 3 wherein said elongated anode is comprised of approximately 82% Cu, 10% Al, 5% Ni and 3% Fe.

5. (Original) A laser as in Claim 1 wherein said elongated cathode is comprised of at least 50% copper and at least 25% zinc.

6. (Original) A laser as in Claim 3 wherein said elongated cathode is comprised of at least 50% copper and at least 25% zinc.

7. (Original) A laser as in Claim 4 wherein said elongated cathode is comprised of at least about 70% copper and at least 25% zinc.

2000-0087-01  
USSN 09/742,485

8. (Original) A laser as in Claim 5 wherein said elongated cathode is also comprised of lead.

9. (Original) A laser as in Claim 8 wherein said elongated cathode is comprised of approximately 61.5% copper, 35.5% zinc and 3% lead.

10. (Original) A laser as in Claim 8 wherein said elongated cathode is comprised of approximately 70% copper, 29.93% zinc and 0.07% lead.

11. (Original) A laser as in Claim 4 wherein said elongated cathode is comprised of approximately 70% copper, 29.93% zinc and 0.07% lead.

12. (Currently Amended) A process for making and using an elongated laser electrode comprising the steps of:

- A) fabricating said electrode from a copper alloy using a machining process,
- B) annealing said electrode to reduce boundary layers in said electrode,
- C) installing said electrode in a gas discharge laser chamber;

wherein said electrode is annealed after it is fabricated using said machining process in order to reduce surface stress and to reduce exposed metallic grain boundary length on surfaces of said electrode.

13. (Original) A process as in Claim 12 wherein said electrode is an anode and said alloy is comprised of aluminum.

14. (Original) A process as in Claim 13 wherein said alloy is also comprised of nickel and iron.

15. (Original) A process as in Claim 12 wherein said electrode is a cathode and said alloy is comprised of zinc.

16. (Original) A process as in Claim 13 wherein said alloy is also comprised of lead.

2000-0087-01  
USSN 09/742,485

17. (Original) A process as in Claim 12 wherein said annealing step comprises heating of said electrode to a temperature of about 50°C below a softening temperature of said copper alloy.